

Value of magnetic resonance imaging in the evaluation of sex-reassignment surgery in male-to-female transsexuals*

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Abstract

Background: We investigated the value of magnetic resonance imaging (MRI) in the evaluation of sex-reassignment surgery in male-to-female transsexual patients.

Methods: Ten male-to-female transsexual patients who underwent sex-reassignment surgery with inversion of combined penile and scrotal skin flaps for vaginoplasty were examined after surgery with MRI. Turbo spin-echo T2-weighted and spin-echo T1-weighted images were obtained in sagittal, coronal, and axial planes with a 1.5-T superconductive magnet. Images were acquired with and without an inflatable silicon vaginal tutor. The following parameters were evaluated: neovaginal depth, neovaginal inclination in the sagittal plane, presence of remnants of the corpus spongiosum and corpora cavernosa, and thickness of the rectovaginal septum.

Results: The average neovaginal depth was 7.9 cm (range = 5–10 cm). The neovagina had a correct oblique inclination in the sagittal plane in four patients, no inclination in five, and an incorrect inclination in one. In seven patients, MRI showed remnants of the corpora cavernosa and/or of the corpus spongiosum; in three patients, no remnants were detected. The average thickness of the rectovaginal septum was 4 mm (range = 3–6 mm).

Conclusion: MRI allows a detailed assessment of the pelvic anatomy after genital reconfiguration and provides information that can help the surgeon to adopt the most correct surgical approach.

Key words: Magnetic resonance imaging—Magnetic resonance imaging, female pelvis—Transsexualism—Neovagina—Sex-reassignment surgery.

Sex-reassignment surgery (SRS) has been performed on thousands of transsexual patients during the past 30 years. Although urologic treatment of male transsexuals is becoming more common [1–4], few follow-up studies have been reported in the literature [5]. Moreover, there is an evident difficulty in objective evaluation of results after SRS. As a matter of fact, the international literature generally lacks consistent published information about surgical results. Evaluation of SRS for male-to-female transsexuals might involve not only functional, aesthetic and psychosexual results but also imaging evaluations. Among the current imaging techniques, magnetic resonance imaging (MRI) is the best modality to evaluate the pelvis [6–8].

We assessed the value of MRI in the evaluation of SRS results.

Materials and methods

Since 1994, at the Department of Urology in the University of Trieste, 57 male-to-female transsexual patients underwent SRS. All patients had been cross-dressing, living as women, and receiving estrogens and progesterone for a long time. Mean age of the patients was 31 years (range = 21–59 years). Before surgery each patient underwent a complete psychosexual evaluation. Hormonal therapy was discontinued 1 month before surgery. Surgical procedure included bilateral orchiectomy and penectomy with the creation of the urethrostomy, neovagina (vaginoplasty), labial structures, and sensate neoclitoris. To create the neovagina, a penile and scrotal skin inversion technique was adopted, using inversion of combined scrotal and penile skin flap for vaginoplasty.

Ten of the 57 patients underwent MRI, seven in the immediate postoperative period and three 1 year after surgery. The MR images were acquired with a 1.5-T superconductive magnet in the sagittal, coronal, and axial planes, with turbo spin-echo T2- and spin-echo T1-

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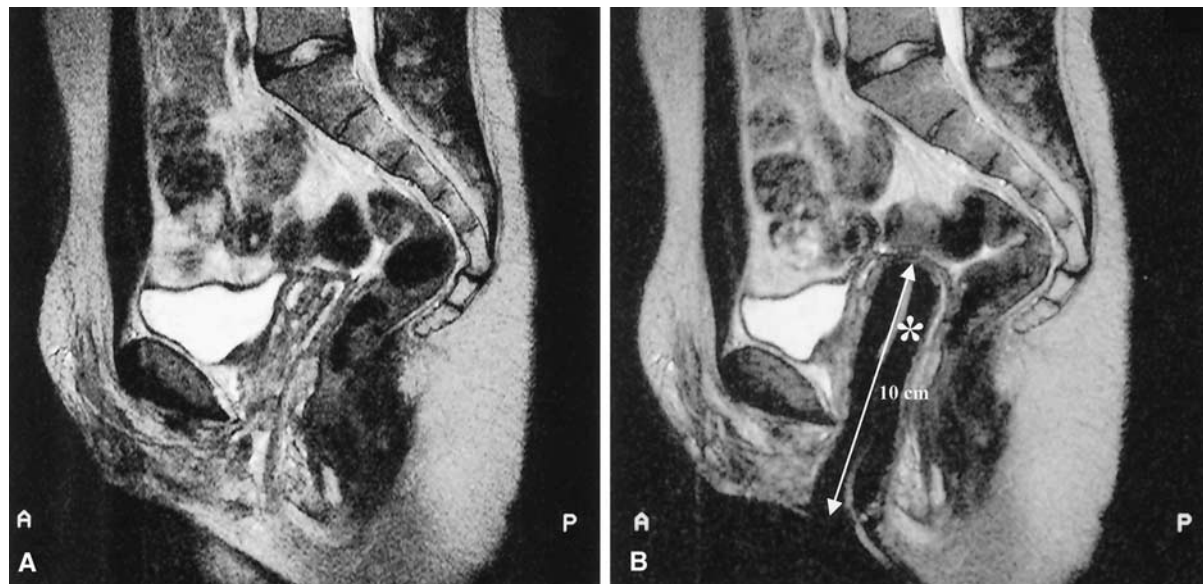


Fig. 1. Sagittal turbo spin-echo T2-weighted images acquired without (A) and with (B) an inflatable silicon tutor in the neovagina (*).

weighted sequences. In all patients images were obtained with and without an inflatable silicon vaginal tutor. The following parameters were considered: neovaginal depth, neovaginal inclination on the sagittal plane, presence of remnants of the corpora cavernosa and of the corpus spongiosum, and thickness of the rectovaginal septum.

Results

Neovaginal depth

The average neovaginal depth was 7.9 cm (range = 5–10 cm). Neovaginal depth was better studied with the inflatable vaginal tutor (Fig. 1).

Neovaginal inclination

The neovagina had a correct oblique inclination in the sagittal plane from front to rear and from low to high in four patients (Fig. 2), similar to the inclination of the natural female vagina (Fig. 3). In five patients, the neovagina had no oblique inclination in the sagittal plane (Fig. 4). In one patient, the inclination was from rear to front and from low to high (Fig. 5).

Remnants of the corpora cavernosa and of the corpus spongiosum

Remnants of corpora cavernosa and residual spongiosa tissue were evident in three patients (Fig. 6), remnants of

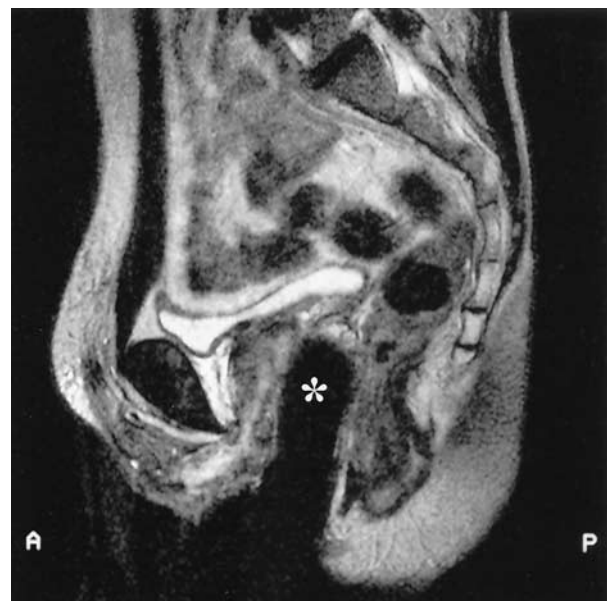


Fig. 2. Sagittal turbo spin-echo T2-weighted image. An inflatable silicon tutor is located in the neovagina (*), which shows a correct inclination from front to rear and from low to high.

corpora cavernosa were evident in three patients, and residual spongiosa tissue was detected in one patient. In three patients, no remnants were detected.

Thickness of the rectovaginal septum

The average thickness of the rectovaginal septum was 4 mm (range = 3–6 mm; Figs. 7–9).

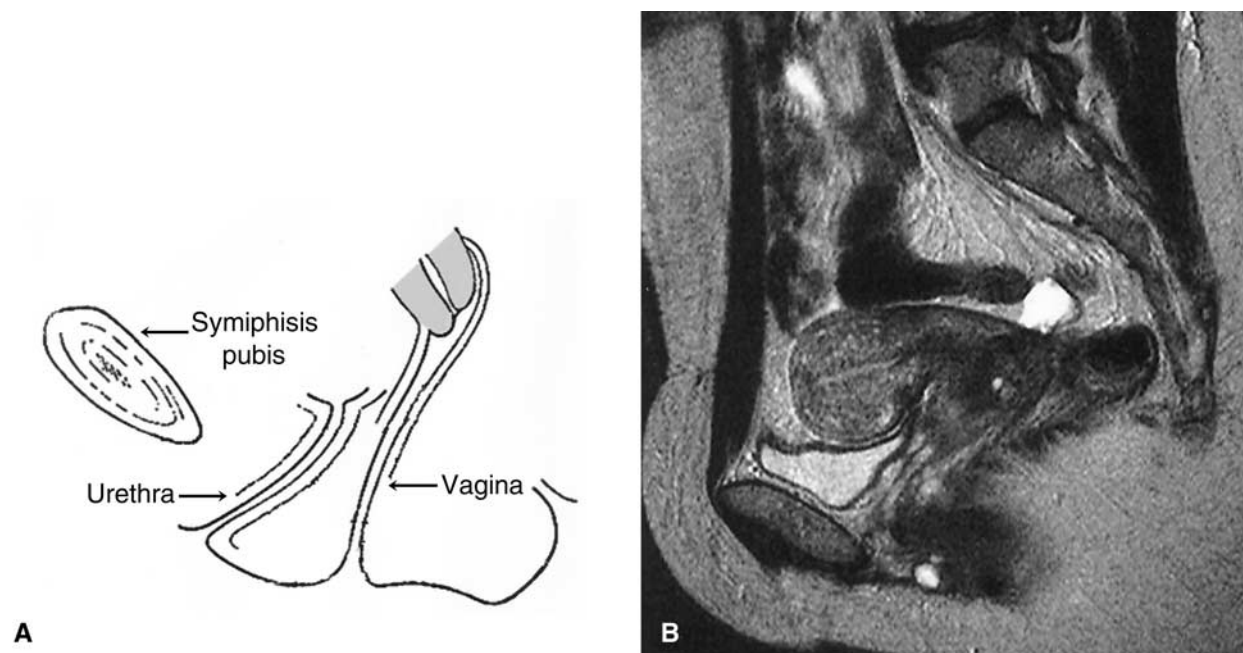


Fig. 3. Scheme (A) and corresponding sagittal turbo spin-echo T2-weighted image (B) show the inclination of the female neovagina.

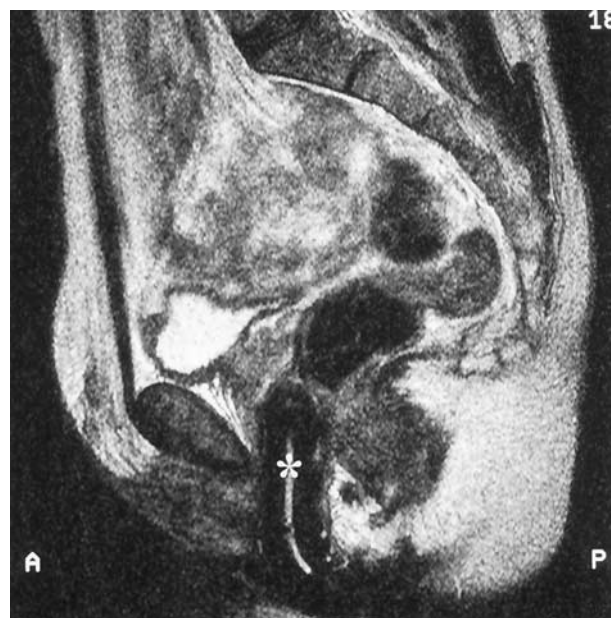


Fig. 4. Sagittal turbo spin-echo T2-weighted image shows an inflatable silicon tutor in the neovagina (*). The neovagina shows no inclination on the sagittal plane.

Discussion

Among the principal aims of SRS is the creation of a neovagina of adequate depth and with correct inclination [2, 3]. MRI accurately depicted both features, which were better evaluated by using an inflatable vaginal tutor. The

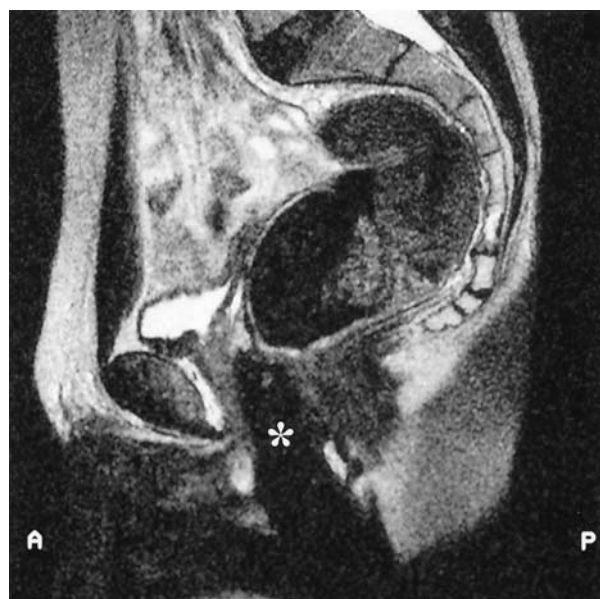


Fig. 5. Sagittal turbo spin-echo T2-weighted image shows an inflatable silicon tutor in the neovagina (*). The neovagina shows an incorrect inclination from rear to front and from low to high.

average neovaginal depth (7.9 cm) was consistent with the normal female vaginal length, which normally ranges from 7 to 8 cm.

MRI showed better results in terms of vaginal depth and inclination in the six patients who underwent surgery within the past 2 years. Such results likely were related to the slightly different surgical approaches.

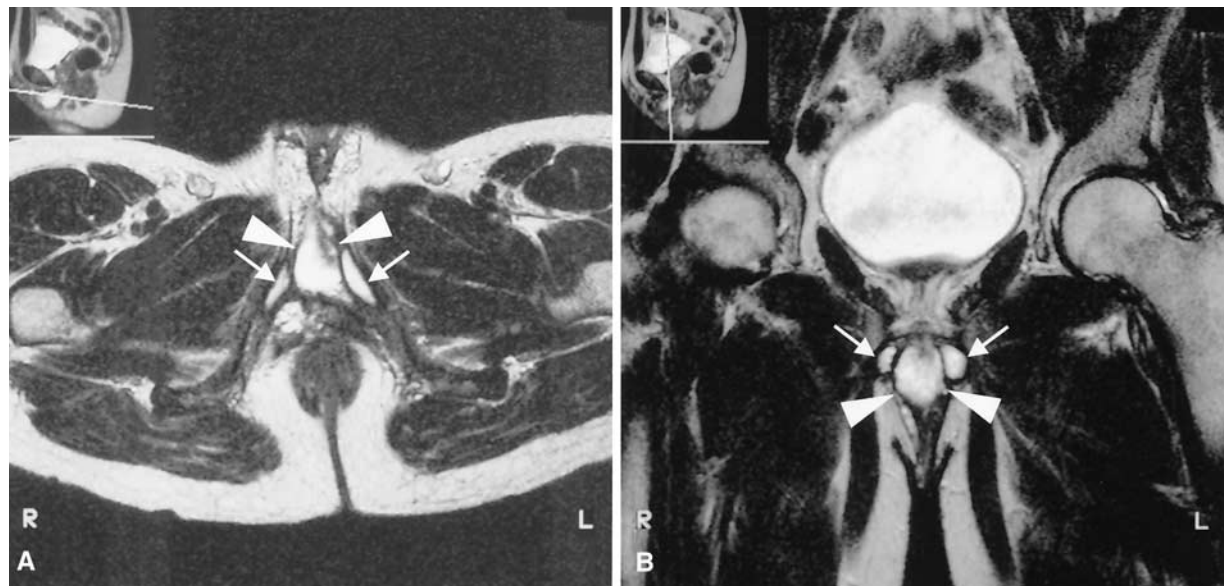


Fig. 6. Axial (A) and coronal (B) turbo spin-echo T2-weighted images show remnants of the corpora cavernosa (arrows) and the urethral corpus spongiosum (arrowheads).

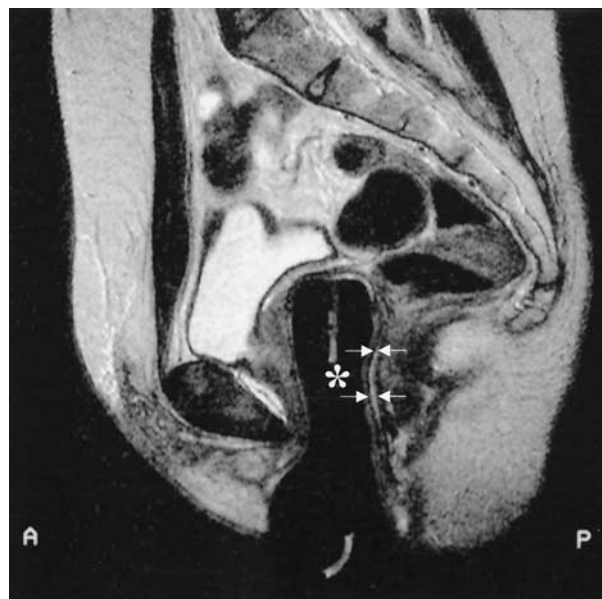


Fig. 7. Sagittal turbo spin-echo T2-weighted image shows an inflatable silicon tutor in the neovagina (*). The rectovaginal septum (arrows) is thin.

MRI accurately depicted remnants of corpora cavernosa and/or corpus spongiosum in seven patients. In three patients, erectile tissues of the corpora cavernosa and corpus spongiosum were not present due to a change in the surgical procedure that currently completely removes them because they often cause unpleasant symptoms related to the protrusion of the urethral meatus and swelling and narrowing of the vagina [1, 4].

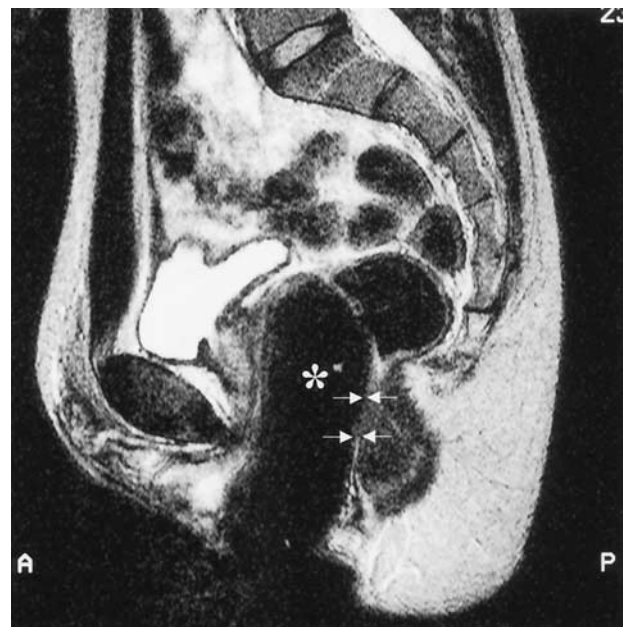


Fig. 8. Sagittal turbo spin-echo T2-weighted image shows an inflatable silicon tutor in the neovagina (*). The rectovaginal septum (arrows) is very thin.

MRI provided an accurate evaluation of the thickness of the rectovaginal septum. In some patients, the septum was thicker because surgeons preserved a part of the bulbocavernosus muscle to obtain a more trophic rectovaginal septum.

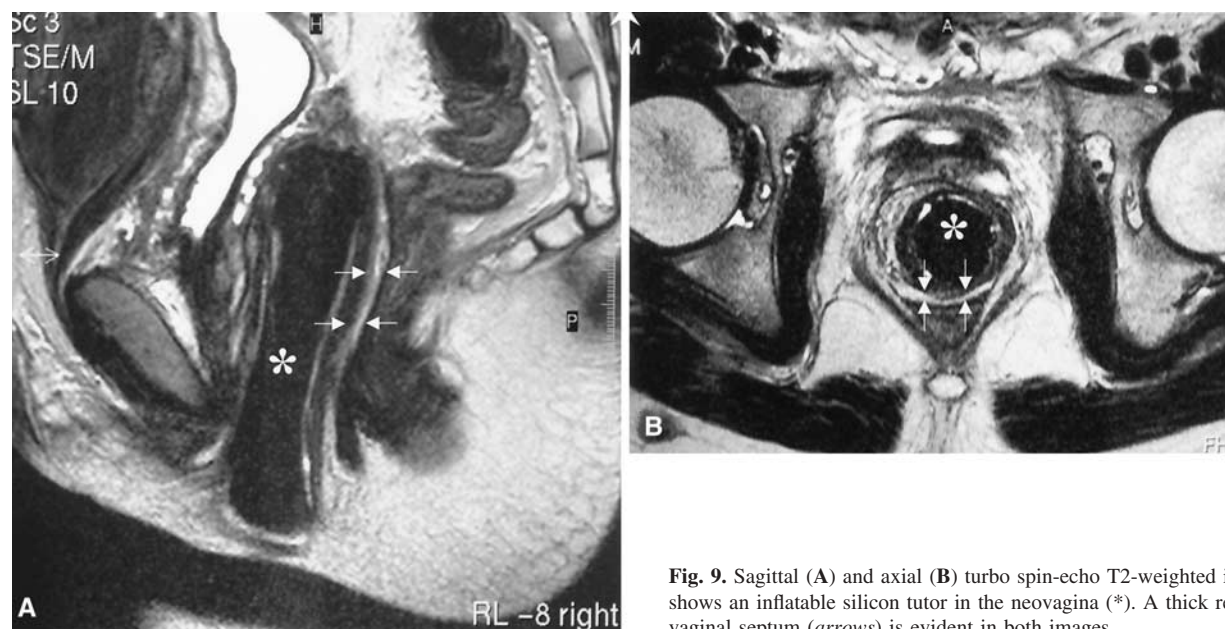


Fig. 9. Sagittal (A) and axial (B) turbo spin-echo T2-weighted images shows an inflatable silicon tutor in the neovagina (*). A thick recto-vaginal septum (arrows) is evident in both images.

Conclusion

MRI allows a detailed assessment of the pelvic anatomy after genital reconfiguration. Moreover, an accurate analysis of MRI findings provides information that can help the surgeon in adopting the most correct surgical approach.

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